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Eleven New Western Millipeds

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Representatives of *seven* of the new species herein described are found in an interesting collection of centipeds and millipeds submitted to me for study by Dr. G. Clifford Carl, director of the Provincial Museum of Natural History at Victoria, British Columbia. Of the other species, two are based upon specimens in a collection made by Borys Malkin in Montana and Oregon during the summer of 1950. The types of one were taken by **Dr. D. T. Jones** at Eugene, Oregon, in 1927, and that of the remaining species by George Moore in Crystal-Stanislaus Cave, Calaveras County, California, in 1950.

Order POLYDESMIDA

NEARCTODESMIDAE

Nearctodesmus malkini, **new species**

The general color of the dorsum is orange, with the caudal corners of the keels yellowish. Legs yellow and antennae brown.

The distinctive features of this species lie especially in the gonopods. In the structure of these it falls in the principal group, those having a spine or spur on the outer process in approximately the same position as in *brunnior* and as shown in Figure 1. This process is characteristically notched or bifid at its apex. The inner process is distinct in its geniculation toward the distal end and in the position of the minute tooth at the angle as shown in Figure 3. The form of the terminal portion of the tibiotarsus of the gonopod is shown in Figure 2, which indicates the position and form of the outer, hook-like tibial lobe and the course of the seminal channel in it.

Length 20-22 mm.; width 2.8 mm.

Locality: Brookings, Curry County, Oregon.

Four specimens were taken Sept. 16, 1950, by B. Malkin.

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Nearctodesmus carli, new species

More deeply colored than *boydi*. Caudal portion of keels light as usual. Legs brown, with the tarsi usually yellowish.

Differing from *boydi* in the form of the distal end of the gonopods of the male, and in having the outer process tridentate instead of bidentate at the tip, as shown in Figure 4. The form of the free end of the inner apophysis is represented in Figure 5.

This is also a somewhat larger form than *boydi*, which seems to be its nearest relative, the width being 3.5 mm.

Localities: Scott Islands: Santine, Cox, Lanz, and Triangle. Specimens were taken on the first three islands in June, 1950, and from Triangle Island in June, 1949, by G. C. Carl.

Nearctodesmus boydi, new species

Body, together with head and antennae, of the cherry red color frequent in the genus. The legs pale yellow or unpigmented.

This form seems to be closely related to the preceding species and to *N. malkini*. It differs from the latter in the details of the gonopods, especially in those of the distal end where it cushions the ectal process at its curve and in this process lacking the conspicuous tooth distad of the curve. The inner process also differs in details. See further Figures 6 and 7.

Width 3 mm.

Locality: Vancouver Island, Lake Cowichan. One male taken Aug. 30, 1906, by O. G. Boyd.

EURYDESMIDAE

Genus *Orophe*, new

Body composed of twenty segments.

Repugnatorial pores present on segments 5, 7, 9, 10, 12, 13, and 15 to 19.

Body narrowed anteriorly, somewhat moniliform. The keels on all segments excepting the most anterior widely separated from each other. Keels with margins smooth and elevated, their corners rounded. Anal tergite subconically pointed. Anal valves mesally compressed.

Sternites without processes.

Gonopods of male elongate; the femur set off from the tibiotarsus, bearing a short, straight spine; tibiotarsus elongate, furcate only distally, the tibial division subdorsal in position, laminate, typically a little surpassed by the tarsal lobe.

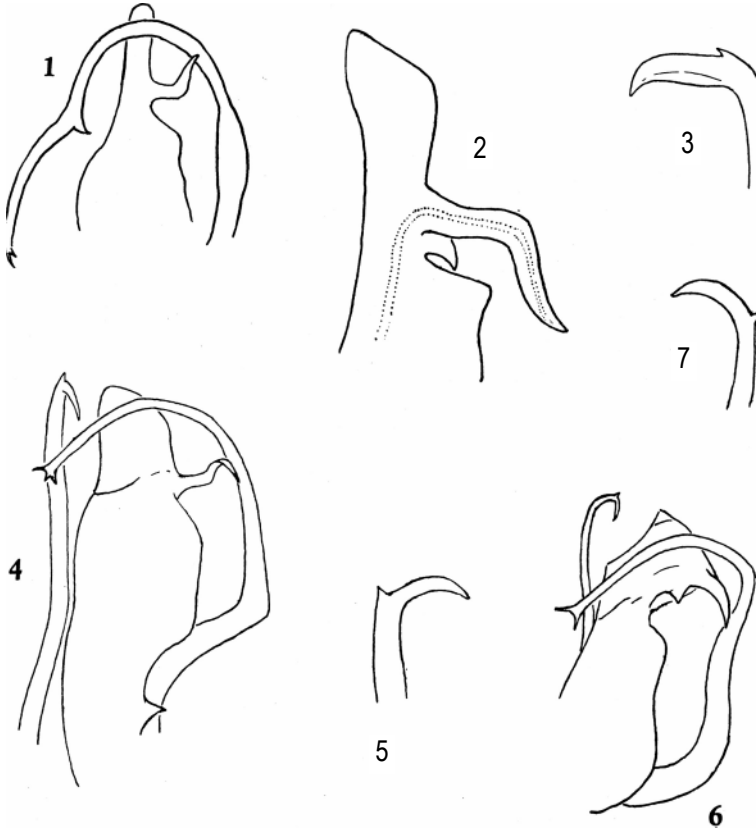


Figure 1. *Nearctodesmus malkini*, n. sp. Distal portion of gonopod of male and of outer apophysis.

Figure 2. The same. Distal end of male gonopod, subdorsal aspect, showing tarsal lobe above and geniculate tibial lobe at right.

Figure 3. The same. Free end of inner apophysis of gonopod.

Figure 4. *Nearctodesmus carli*, n. sp. Distal portion of left gonopod and its apophyses, subventral view.

Figure 5. The same. Free end of inner apophysis.

Figure 6. *Nearctodesmus boydi*, n. sp. Left gonopod, subectal view.

Figure 7. The same. Free end of inner apophysis of gonopod.

Legs in the male lacking tibial pads.

Generotype: *Orophe cabinetus*, new species.

Distinguished from the other known North American genera especially in the elongate and relatively simple gonopods of the male.

Orophe cabinetus, new species

Brown adjacent to the segmental sulcus of each segment, the caudal border of the metatergite also somewhat orange, with the keels above and below a clearer yellow; anterior portion of prozonites light colored. Legs pale brown, the antennae dark brown. Head yellowish except at the sides and over the clypeal region, where yellow.

Vertigial sulcus sharply impressed, ending a little above level of the antennal sockets. Surface of head essentially glabrous, excepting transverse series of setae on lower clypeal and labral region. Antennae filiform, the articles between the first and the seventh not much differing in length from each other. The collum decidedly wider than the head; keels rounded; surface smooth excepting a margining sulcus on each side continuing part way up anterior border.

Keels of the second, third and fourth tergites wide and in contact with each other, or nearly so; the following keels narrower and widely separated. Margins of keels smooth, elevated into a sharp rim within which the surface appears depressed; anterior and posterior corners rounded. Surface of all tergites smooth, or showing fine, low longitudinal rugae on each side of some of the segments.

Last tergite narrowly caudate, much surpassing the anal valves. Anal valves with mesal border moderately compressed and elevated, the elevated border set off by a shallow furrow or depression.

Legs with all joints lacking spines.

Gonopods as shown in Figures 8 and 9.

Length about 28 mm.; width 3.5 to 4 mm.

Locality: Clark's Peak, Cabinet National Forest, Montana. Elevation 3000-4000 feet.

Four specimens taken by B. Malkin on July 4, 1950.

Also Koo-koo-sint Ridge, in the same forest. One female more sharply annulate than the others, taken July 5, 1950.

Genus Sigmocheir, new

Body having the general structure and appearance of *Xystocheir*. Dorsum only moderately convex; the keels wide and nearly horizontal in position, contiguous or subcontiguous with each other. None of joints of legs spined in the type.

Distinct from *Xystocheir* and other related genera in the structure of the gonopods. The tibiotarsus is a simple blade which is apically bifid into a short seminiferous branch and an adjacent lamina; a single straight spine borne on the mesal side.

Generotype: *Sigmocheir calaveras*, new species.

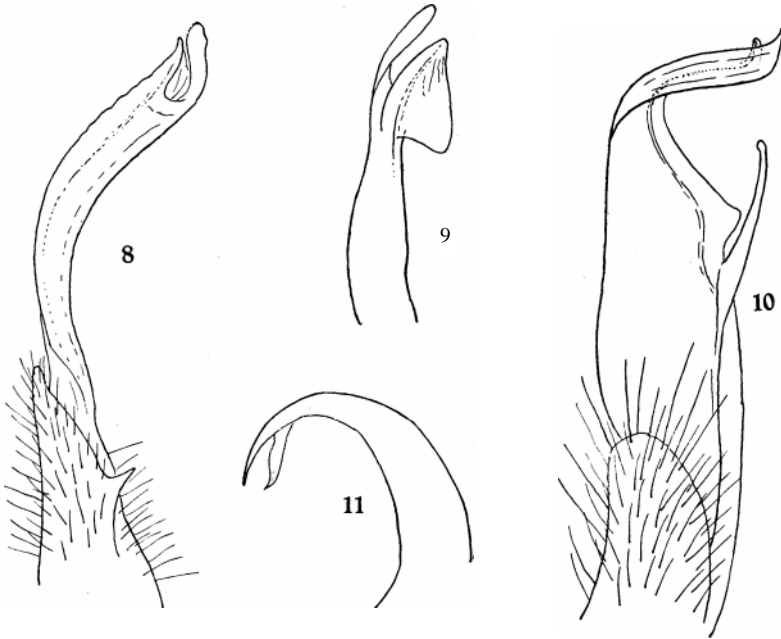


Figure 8. *Orophe cabinetus*, n. sp. Right gonopod, mesal view.

Figure 9. The same. Distal portion of right gonopod, ventral view.

Figure 10. *Sigmocheir calaveras*, n. sp. Right gonopod, subventral view.

Figure 11. The same. Gonopod, subdistal view, showing course of seminal channel in outer branch.

Sigmocheir calaveras, new species

Color of the dried type testaceous brown, with the keels and legs paler, yellowish.

Collum wider than the head; the lateral and anterior margins together forming an even semicircle; caudal margin slightly arcuate.

Second and third tergites wide, the others narrowing to the fourth. Keels of the anterior and all but the most posterior tergites with caudal corners subrectangular, the outer margin smooth and a little convex, with the anterior corners of those caudad of the fourth rounded. Posterior corners

of nineteenth keels produced caudad, the processes distally rounded; posterior corners of seventeenth and eighteenth keels bending a little caudad, the posterior margins of others essentially transverse.

The characteristic features of the male gonopods are shown in Figures 10 and 11.

Width of male holotype about 6.6 mm.

Locality: Calaveras County, California. One male taken in Crystal-Stanislaus Cave on Nov. 25, 1950, by George Moore.

Order CHORDEUMIDA

CONOTYLIDAE

Conotyla jonesi, new species

Color yellowish or light horn brown, with a rather broad median longitudinal black band on dorsum and a dark band at level of carinae on each side. Legs yellow, in part somewhat dusky.

Antennae filiform, the fifth article twice or more the length of the sixth. Ocelli in four or five rows, about twenty-two in number; e. g., counting from top, 7, 6, 5, 4 (or 3, 1).

Carinae swollen, much as in *atrolineata*. The large dorsal setae normal in arrangement.

In the male, the first two pairs of legs reduced, and the next five pairs conspicuously thickened in the typical manner.

The species resembles *atrolineata* in color and general structure, but is a notably smaller form with obvious differences in the gonopods, of which the posterior pair are much less complex. See Figure 12. The form of the ninth legs of the male as shown in Figure 13.

Length about 10 mm.

Locality: Eugene, Oregon.

Several males and females collected by Dr. D. T. Jones, Nov. 1, 1927.

Genus *Zygotyla*, new

Similar to *Trichopetalum* in having only 28 body segments, but differing in having the antennae long and slender as in *Conotyla*, with the eyes also strongly developed as in the latter genus. While the first two pairs of legs in the male are moderately reduced, as in *Conotyla*, the legs of the fourth to the sixth pairs are not crassate and none of the legs bear a process on any of the joints.

Generotype: *Zygotyla phana*, new species.

Zygotyla phana, new species

The body nearly colorless with the exception of a brownish mark on the caudal border of each metatergite, this mark expanding from the sides toward the middle, having thus a low deltoid shape, the series of spots more or less narrowly connected by a median longitudinal line. There is also a dark line along each side at the level of the keels, on which the line tends

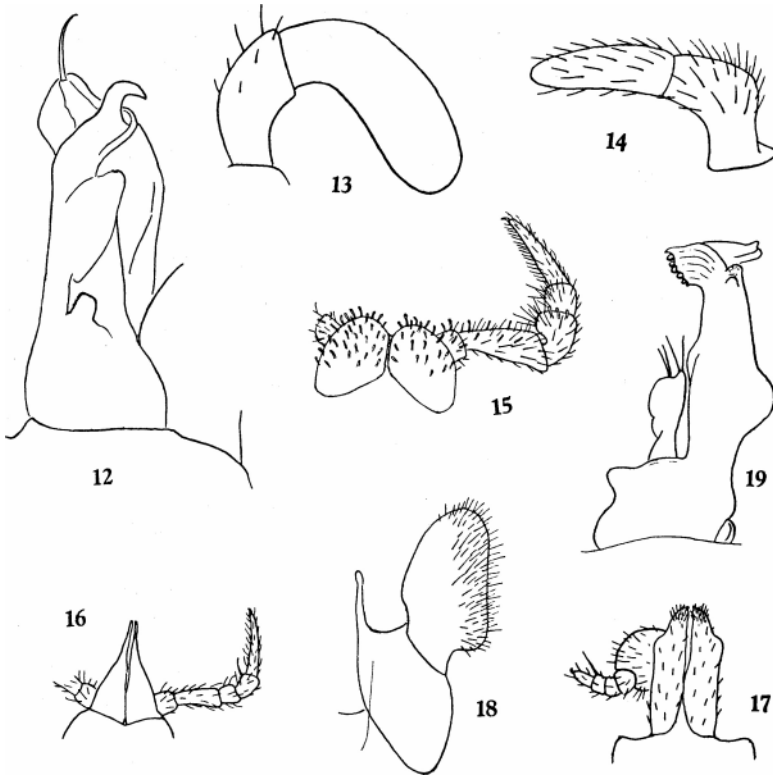


Figure 12. *Conotyla jonesi*, n. sp. Gonopod, posterior view.

Figure 13. The same. Ninth leg of male.

Figure 14. *Zygotyla phana*, n. sp. Left ninth leg of male, anterior aspect.

Figure 15. *Opiona columbiana*, n. sp. First leg of male.

Figure 16. The same. Second leg of male.

Figure 17. The same. Third leg of male.

Figure 18. The same. Left ninth leg of male, caudal aspect.

Figure 19. The same. Left gonopod, ectal aspect (drawn on larger scale than legs).

to widen, the dark color on anterior segments extending well down the sides. Legs with proximal joints colorless and the distal joints brownish to dusky. Head brownish except on the sides and the lower part of the face. Antennae dilute brown, with the first article and the proximal half of the second pale.

Antennae filiform, not clavate, the proportions of the articles being more like those of *Conotyla* than those of *Trichopetalum*, the third article clearly longest, the fifth next in size.

Ocelli in three oblique series; e.g., 7, 5, 3.

Carinal swellings distinct on posterior segments as well as on those of the middle and anterior region. Setae of tergites normal in number and position.

The ninth legs of the male with the second article subcylindrical or narrowing a little toward end; distally pigmented. See Figure 14. The gonopods seem to have been broken off in the type.

Length about 9.75 mm.

Locality: Blue River, British Columbia. One male taken Sept. 9, 1948 by E. E. French.

CASEYIDAE

Genus *Opiona*, new

Resembling *Vasingtona* in having the coxae of the seventh and tenth legs in the male normal in size and structure. Differing from this and other known genera in having the first legs of the male enlarged and densely clothed with partly bacilliform or clavate setae. Second legs of male reduced in size, with coxae bearing prominent, slender processes. Coxae of the third legs greatly elongate, with third joint much inflated and other articles reduced.

Generotype: *Opiona columbiana*, new species.

Opiona columbiana, new species

The general color of the body is light horn brown. Legs and antennae colorless.

Vertex of head conspicuously elevated and rounded between the eyes, sparsely setose. Ocelli in an elongate patch, arranged mostly in three or four series; e.g., 6, 5, 2, 1. Antennae long, moderately clavate distad of the fourth article; the third joint much longest, the fifth next in length, the sixth considerably longer than the seventh.

The features of the first legs of the male are shown in Figure 15; the clavate setae are covered over terminal part with numerous fine points or prickles. The second legs much reduced in size, with long processes from their coxae; on the mesal side of penult joint a large seta (Fig. 16). The third

legs of male with coxae greatly elongate and the third joint globosely much enlarged, while the remaining joints are reduced, the penult bearing a special seta similar to that of the second legs (Fig. 17).

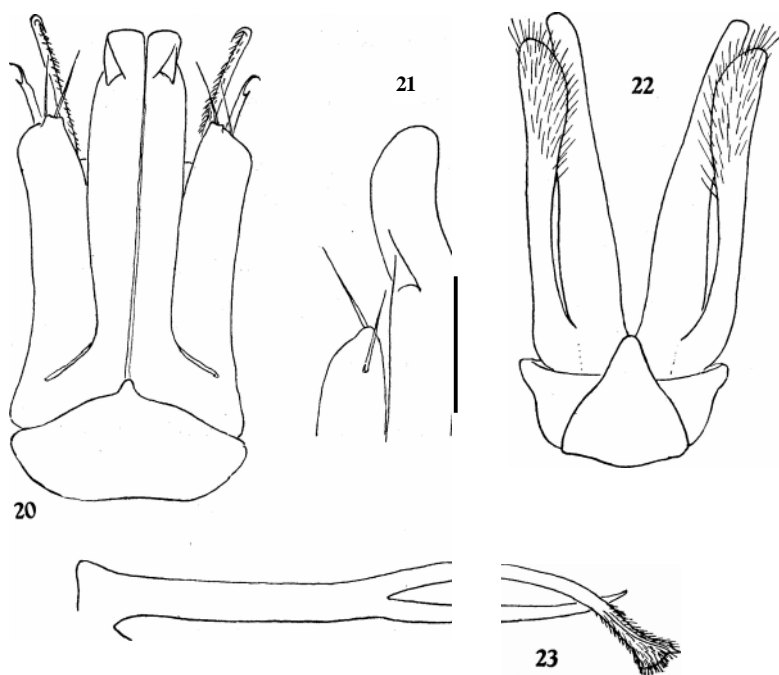


Figure 20. *Nemasoma leechi*, n. sp. Gonopods of male, anterior view.

Figure 21. *Nemasoma uta* Chamberlin. Distal ends of coxite and telopodite of anterior gonopod.

Figure 22. *Bollmaniulus spenceri*, n. sp. Anterior gonopods, anterior aspect.

Figure 23. The same. Right posterior gonopod, caudal aspect.

The ninth legs of the male with first joint bearing a prominent erect apophysis at inner mesal angle (Fig. 18). Gonopods as represented in Figure 19.

Length about 11 mm.

Locality: Victoria, British Columbia. One male and two females taken in 1949.

O r d e r J U L I D A

N E M A S O M I D A E

Nemasoma leechi, new species

A small slender form from 9 to 12 mm. in length and about 0.8 mm. in diameter. Body with segmental constrictions giving it a moniliform appearance.

Color blackish above, with narrow yellow annuli; also yellowish over venter and lower part of sides. Legs brown or in part yellowish.

The usual four setae on vertex of head. Eyes relatively large, consisting of 30-32 ocelli arranged in 5 longitudinal series.

Distinguished from other species of this apparently circumpolar genus in the details of the gonopods which are illustrated in Figure 20. From *N. uta*, the only other species at present known from western North America, notably different in the proportionately much shorter terminal division or lobe of the coxites of the anterior gonopods (cf. Fig. 20 with 21).

Number of segments in adult male 40.

Locality: Trinity Valley, British Columbia. Five specimens taken Sept. 16, 1943, by Hugh B. Leech.

There are also 5 specimens without definite locality, but noted as probably from the Cariboo and taken in 1946.

PARAIULIDAE

Bollmaniulus spenceri, new species

Color bluish black, with a narrow light stripe running across each tergite between the pores and in front of this a transverse series of small light dots; first two or three tergites showing typically a somewhat chestnut background. Antennae black and legs brown. Vertex of head showing a chestnut background, the area between eyes black.

Interocular sulcus sharply impressed, angled at middle, the vertigial sulcus ending on the angle. Eyes black, composed of numerous ocelli arranged in seven transverse series; e.g., 10, 10, 10, 8, 7, 5, 3.

Lower border of collum with four longitudinal sulci above the margining sulcus.

Pores widely removed from the segmental sulci.

Anal tergite rounded behind, moderately surpassing the valves.

Cardo of mandibles in the male excavated below, with anteroventral corner strongly produced. The first legs of male conspicuously crassate as usual.

Apparently quite distinct from previously known species in the details of the gonopods, especially those of the posterior pair, as shown in Figures 22 and 23.

Number of segments 55-56.

Diameter 2.8-3 mm.

Locality: Kamalloops, British Columbia, top of Wheeler Mt. (3, 800 ft.). Five specimens taken by Prof. G. J. Spencer, Sept 1, 1944.

Also two specimens taken under wolf dung, in the Pass Lake area, Kamalloops, on June 9, 1941 by the same collector.

Order SPIROBOLIDA

RHINOCROCIDAE

Rhinocricus vancouveri, new species

The color of the preserved specimens is cinereous, ringed with brown. The legs and antennae are deep brown to black.

Head with the fine median sulcus extending across vertex and down the front to the clypeal incision, the sulcus faint or slightly interrupted at upper

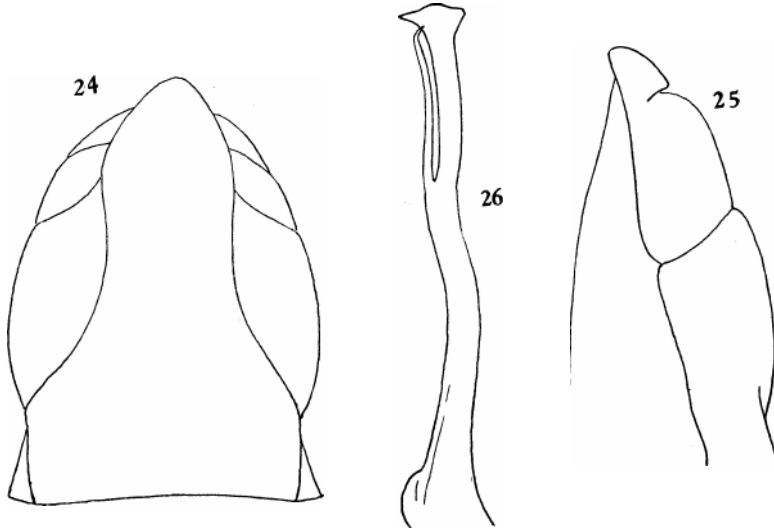


Figure 24. *Rhinocricus vancouveri*, n. sp. Anterior gonopods, anterior aspect.

Figure 25. The same. Left anterior gonopod, caudal view, with basal part omitted.

Figure 26. The same. Posterior gonopod.

level of antennal sockets. Eyes composed of black, sharply defined ocelli about 49 in number, these arranged in seven transverse series; e.g., 7, 9, 9, 8, 7, 6, 3. Sensory cones of antennae four in number.

Collum of the usual form; smooth excepting the anterolateral margining sulcus.

Tergites with segmental sulcus fine, complete across dorsum. Pores, beginning on sixth segment, contiguous with sulcus which is- excurved and embraces the pore on its caudal side. Tergites smooth above, the prozonites on sides below with oblique sulci, the metazonites with a series of longitudinal sulci below, the series extending only part way up to the level of the pore. Anal tergite smooth, ending even with the valves.

Scobina consisting of a lunate impression at margin, followed by a finely striate area which is moderately elongate and is rounded at the caudal end. Scobina small and widely separated; beginning on sixth segment or earlier and continuing back to the eighth or ninth segment from the last.

Best distinguished by form of the gonopods as shown in Figures 24, 25 and 26.

Number of segments in male type 44-45.

Diameter of male 5 mm.

Locality: Vancouver Island, Clayoquot Sound.

Two adult males and two partly grown females were taken in the summer of 1926 by G. J. Spencer.